Dr. Hamish Stuart Greig

Assistant Professor of Stream Ecology

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RESEARCH INTERESTS

Ecosystem responses to climate change; community dynamics across environmental gradients; temperature-dependence of food webs; forest-freshwater linkages; freshwater macroinvertebrates.

EDUCATION

2008 Ph.D. in Ecology. University of Canterbury, Christchurch, New Zealand. *Thesis:* Community assembly and food-web interactions across pond permanence gradients.

2003 B.Sc. Honours 1st Class. University of Canterbury, Christchurch, New Zealand. *Thesis:* The effect of predatory trout on a detritivorous caddisfly and organic matter dynamics.

CURRENT PROFESSIONAL POSITIONS

2018- Graduate Coordinator, Ecology and Environmental Science Program
2017- Associate Editor: *Freshwater Science*
2015- Associate Editor: *Ecology and Evolution*
2015- Co-operating member of the Margaret Chase Smith Policy Centre.
2015-2017 University of Maine Faculty Fellow
2013- Assistant Professor of Stream Ecology. University of Maine, Orono, Maine
2013-2015 University of Maine Centre for Undergraduate Research Fellow.

PAST PROFESSIONAL POSITIONS

2013 Marsden Postdoctoral Fellow, School of Biological Sciences, University of Canterbury, Christchurch, New Zealand.
2011-2012 New Zealand Foundation for Research, Science and Technology Postdoctoral Fellow, School of Biological Sciences, University of Canterbury, Christchurch, New Zealand.
2009-2011 New Zealand Foundation for Research, Science and Technology Postdoctoral Fellow, Department of Forest Sciences and Biodiversity Research Centre, University of British Columbia.
2009 Postdoctoral Research Fellow, University of Canterbury.
2004-2007 Visiting Researcher, Rocky Mountain Biological Laboratory, Colorado, USA.
2001-2004 Research Assistant, University of Canterbury.

AWARDS AND HONORS

2015-17 University of Maine Faculty Fellow
2014 University of Maine Centre for Undergraduate Research Faculty Fellowship
2014 University of Maine Pre-Tenure Research and Creative Activity Fellowship
2010 Best Student Paper, New Zealand Freshwater Sciences Society.
2008 North American Benthological Society Petersen Travel Award.
2008 Honorable mention, Best Publication by a New Researcher, New Zealand Ecological Society.
2004 Travel Award, Canterbury Branch of the Royal Society of New Zealand.
2004 North American Benthological Society Petersen Travel Award.

2003 NZ Limnological Society SIL Trust Prize, Best Student Presentation. Joint Australian Society for Limnology and New Zealand Limnological Society Congress.

GRANTS AND CONTRACTS AWARDED ($1,320,421 while at U.Maine)

1. Nelson, S. J. and **Greig, H. S.** 2018 Linking Freshwater Mercury Concentrations in Parks to Risk Factors and Bio-Sentinels: A National scale research and citizen science partnership. USGS …… **$43,247**

2. **Greig, H. S.,** Crandall, M., Fraver, S., Klemmer, A. J, and Northington R. M. 2018. Quantifying the investment and outcomes of alternative riparian management strategies. Maine Cooperative Forestry Research Unit. …… **$34,217**

3. **Greig, H. S.** REU supplement to DEB-1820534. Collaborative Research: Consequences of Climate-Induced Range Shifts on Multiple Ecosystem Functions. 2018. National Science Foundation (Division of Environmental Biology) …… **$11,042**

4. **Greig, H. S.,** Crandall, M., Fraver, S., Klemmer, A. J, and Northington R. M. 2018. Assessing riparian management as a tool for balancing Maine's forest economies and freshwater resources: a collaborative undergraduate research approach UMaine Interdisciplinary Undergraduate Research Collaborative. …… **$23,900**

5. Kenefic. L. A. Raj Jizah, S. Fraver and **H. S. Greig**. (2017 – 2018) Silvicultural Treatments and Operational Considerations for Lowland Northern White-Cedar. Collaborative Forestry Research Unit …… **$15,681**

6. Nelson, S. **Greig, H. S**., Klemmer, A. J., Eagles-Smith, C. and Pritz, C. F. (2018). Connecting the dots: determining temporal mercury flux via aquatic insects to avian predators in Acadia National Park. UMaine Research Reinvestment Fund (RRF) 2017-18 Student Awards Competition. …… **$29,635**

7. Nelson, S. **Greig, H. S**., Klemmer, A. J., Eagles-Smith, C. and Pritz, C. F. (2017). *Graduate student support to continue UM's lead role in the Dragonfly Mercury Project across US National Parks.* UMaine Research Reinvestment Fund Student Assistantship competition. …… **$30,000**

8. Saros, J. **Greig, H. S**. (2017). *PME MiniDOT oxygen and temperature submersible sensors*. SBE MEIF Equipment Mini Grant…… **$7,000**

9. Nelson S, Wilson, K., Fernandez, I., Daly, J., MacRae, J., Hodgkins, G., Blomberg, E., Crandall, M., **Greig, H. S**., Dudley, R. and Shearin, A. 2017. *Maine's Changing Winter: focus on natural resources, ecology, and the economy.* Maine Water Resources Research Institute. …… **$5,000**

10. Wissinger, S. A., **Greig, H. S.**, and B. Taylor. (2016-2019). *NSF DEB Ecosystems RUI: Collaborative Research: Consequences of Climate-Induced Range Shifts on Multiple Ecosystem Functions.* National Science Foundation…… **$850,582**

11. **Greig, H. S.,** Coghlan, S., and Zydlewski, Z. (2016 – 2018). *Improving assessment of critical habitat for Atlantic salmon in a rapidly-changing climate: unravelling the impacts of temperature, flow, prey availability, and competitors on juvenile* **$88,635**

performance. Maine Sea Grant……

12. Saros, J. **Greig, H. S**., and Northington, R. M. (2016). *Turner Designs pCO2 sensor*. SBE MEIF Equipment Mini Grant. …….. **$7,031**
13. **Greig, H. S.** (2015 - 2020). *Unraveling the multiple impacts of climate change on freshwater food webs: a multi-scale approach.* USDA Hatch (Value based on 50% salary and graduate student support) …… **$200,000***
14. **Greig, H. S.** (2015) The Bangor Savings Faculty Development Fund Travel Award……. **$1,492**
15. **Greig, H. S.** (2014-2015) *Using experiments to unravel the multiple impacts of climate change on freshwater food webs.* University of Maine Pre-Tenure Research and Creative Activity Fellowship …… **$25,000**
16. **Greig, H. S.** (2013 – 2015) *Are freshwater communities subject to local environmental stress more vulnerable to the regional impacts of climate change?* USDA Hatch (Value based on 33% professional staff + benefits for 2y and graduate student support) …….. **$90,000***
17. **Greig, H. S.** and O'Connor, M. I. (2012) *Synthesizing theory and databases to advance a general framework for how warming affects trophic interactions* National Centre for Ecological Analysis and Synthesis working group…… **$45,000**
18. **Greig, H. S.** and O'Connor, M. I. (2011) *Integrating body size and thermal scaling to understand the effects of temperature on food webs.* Canadian Institute of Ecology and Evolution working group. …… **$24,000**
19. **Greig, H. S.** (2009 – 2011) *How does past climate predictability influence community assembly and resilience to climate change?* New Zealand Foundation for Research, Science and Technology Postdoctoral Fellowship…… **$180,000**
20. **Greig, H. S.** (2009). *How does past climate predictability influence community assembly and resilience to climate change?* Canadian Department of Foreign Affairs and Trade Postdoctoral Research Fellowship. …… **$32,000**
21. **Greig, H. S.,** and McIntosh, A. R. (2005 – 2008) *Local and regional control of wetland communities in grassland ecosystems*. Miss E. L. Hellaby Indigenous Grassland Research Trust …… **$26,700**
22. **Greig, H. S.** (2005 – 2008). *The influence of hydroperiod and ecosystem size on the community structure of high country ponds.* TEC Top Achiever Doctoral Scholarship… **$ 96,180**

* approximate value

PEER-REVIEWED JOURNAL ARTICLES AND BOOK CHAPTERS (Cited 1299 times as of 09/06/18, h-index = 17; Google Scholar). † Graduate student co-author; *Undergraduate student co-author.

MANUSCRIPTS IN REVIEW:

1. Haghkerdar, J.M., McLachlan, J.R**., Greig, H.S**. *In review* Disturbance frequency affects stream community structure through repeated environmental filtering events.
2. McLachlan, J.R. †, Haghkerdar, JM†, and **H.S. Greig**. *In review*. High spatial turnover of benthic community structure across a tidal freshwater height gradient. *Freshwater Biology*
3. **Greig, H. S.** Warburton H. J.†, McHugh, P. A., Thompson, R. M. and A. R. McIntosh. *In review*. Contrasting effects of habitat size on community resistance and resilience. *Ecology*.

PUBLISHED PEER REVIEWED ARTICLES AND CHAPTERS

1. Hammill, E; Hawkins, C; **Greig, H. S**. Kratina, P; Shurin, J. S., Atwood, T. *In press*. Landscape heterogeneity strengthens the relationship between β-diversity and ecosystem function. *Ecology*
2. McIntosh, A. R., M. J. Plank, P. G. Jellyman, P. A. McHugh, H. J. Warburton† and **H. S. Greig**. 2018 Capacity to support predators scales with habitat size. *Science Advances.* 4 (7), eaap7523.
3. Weaver, D. M.†, Coghlan, S. M., **Greig, H. S**., Klemmer, A. J., Perkins, L. B., and Zydlewski, Z. 2018. Resource and consumer flux mediated by sea lamprey subsidies between marine and freshwater ecosystems. *River Research and Application.*
4. Pelletreau, K. N., T. Andrews, N. Armstrong, M. A. Bedell, F. Dastoor, N. Dean, S. Erster, C. Fata-Hartley, N. Guild, **H. S. Greig**, D. Hall, J. K. Knight, D. Koslowsky, P. P. Lemons, J. Martin, J. McCourt, J. Merrill, R. Moscarella, R. Nehm, R. Northington, B. Olsen, L. Prevost, J. Stoltzfus, M. Urban-Lurain, and M. K. Smith. 2016. A clicker-based case study that untangles student thinking about the processes in the central dogma. *CourseSource.*
5. **Greig, H. S**. and M. L. Galatowitsch. 2016. Hydrology and ecology of ponds and tarns. Pp 283-308, *in* C. P. Pearson, T. Davie, P. G. Jellyman, and J. S. Harding, editors. Advances in New Zealand Freshwater Science: New Zealand Hydrological Society and New Zealand Freshwater Science Society, Christchurch, New Zealand.
6. **Greig, H. S.** and A. J. K. Calhoun. 2015. Searching for the holy grail of wetland integrity: are biological indicators still relevant in conservation planning? Pages 101-117 *in* D. Lindenmayer, J. Pierson, and P. Barton, editors. Surrogates and Indicators in Ecology, Conservation and Environmental Management. CSIRO Publishing, Melbourne, CRC Press, London.
7. Atwood, T. B., E. Hammill, P. Kratina, **H. S. Greig,** J**.** B. Shurin, and J. S. Richardson. 2015. Warming alters food web-driven changes in the CO_2 flux of experimental pond ecosystems. *Biology Letters*. 11: 20150785. DOI: 10.1098/rsbl.2015.0785
8. Lindenmayer, D., J. Pierson, P. Barton, M. Beger, C. Branquinho, A. Calhoun, T. Caro, **H. Greig**, J. Gross, J. Heino, M. Hunter, P. Lane, C. Longo, K. Martin, W. H. McDowell, C. Mellin, H. Salo, A. Tulloch, and M. Westgate. 2015. A new framework for selecting environmental surrogates. *Science of the Total Environment.* 538: 1029–1038 doi:10.1016/j.scitotenv.2015.08.056
9. McHugh, P. A., R. M. Thompson, **H. S. Greig,** H. J. Warburton†, and A. R. McIntosh. 2015. Habitat size influences food web structure in drying streams. *Ecography.* 38: 700-712.

10. Kitto, J.A.J. †, D.P. Gray, **H.S. Greig**, D.K. Niyogi, and J.S. Harding. 2015. Meta-community theory and stream restoration: evidence that spatial position constrains stream invertebrate communities in a mine impacted landscape. *Restoration Ecology* 23:284-291.
11. DeLong, J. P., B. Gilbert, J. B. Shurin, V. M. Savage, T. B. Brandon, C. F. Clements, A. I. Dell, **H. S. Greig**, C. D. G. Harley, P. Kratina, K. S. McCann, T. D. Tunney, D. A. Vasseur, and M. I. O'Connor. 2015. The body size dependence of trophic cascades. *The American Naturalist* 185:354-366.
12. Gilbert, B., T.D. Tunney, K.S†. McCann, J.P. DeLong, D.A. Vasseur, V. Savage, J. B. Shurin, A.I. Dell, B.T. Barton, C.D.G. Harley, H.M. Kharouba†, P. Kratina, J.L. Blanchard, C. Clements†, M. Winder, **H.S. Greig**, & M.I. O'Connor. 2014. A bioenergetic framework for the temperature dependence of trophic interaction strength. *Ecology Letters.* 17:902-914.
13. Vasseur, D.A., J.P. DeLong, B. Gilbert, **H.S. Greig**, C.D.G. Harley, K.S. McCann, V. Savage, T.D. Tunney†, & M.I. O'Connor. 2014. Increased temperature variation poses a greater risk to species than climate warming. *Proceedings of the Royal Society B: Biological Sciences.*281: 20132612.
14. **Greig, H. S**., S. A. Wissinger, and A. R. McIntosh. 2013. Top-down control of prey biomass increases with drying disturbance: an unexpected consequence of non-consumptive interactions? *Journal of Animal Ecology.* 82(3): 598-607. doi: 10.1111/1365-2656.12042.
15. Atwood, T. B†., E. Hammill, **H. S. Greig**, P. Kratina, J. B. Shurin, D. S. Srivastava and J. S. Richardson. 2013. Predators reduce CO_2 emissions from freshwater ecosystems. *Nature Geoscience.* 6: 191-194. doi:10.1038/ngeo1734. *Coverage in ScienceNews, New Scientist, ScienceNews for Kids, Vancouver Sun.*
16. Shurin, J. B., J. Clasen, **H. S**. **Greig,** P. Kratina, and P. L. Thompson†. 2012. Warming shifts top-down and bottom-up control of pond food web structure and function. *Philosophical Transactions of the Royal Society B: Biological Sciences.* 367: 3008-3017.
17. **Greig, H. S**., P. Kratina, P. L. Thompson†, W. J Palen, J. S. Richardson, and J. B. Shurin. 2012. Warming, eutrophication and predator loss amplify subsidies between aquatic and terrestrial ecosystems. *Global Change Biology*. 18: 504-514.
18. Kratina, P., **H. S**. **Greig**, P. L Thompson†, T. S. A. Carvalho-Pereira*, and J. S. Shurin. 2012**.** Warming modifies trophic cascades and eutrophication in freshwater ecosystems. *Ecology.* 93: 1421-1430.
19. Klemmer, A. K†., S. A. Wissinger, **H. S. Greig**, and M. L. Ostrofsky. 2012. Strong single-species effects of a detritivore on multiple ecosystem processes. *Journal of Animal Ecology.* 81: 770-780. *Highlighted by editor on journal home page*.
20. **Greig, H. S.,** D. K. Niyogi, K. L. Hogsden†, P. G. Jellyman† and J. S. Harding. 2010. Heavy metals: confounding variables in the response of New Zealand freshwater fish assemblages to natural and anthropogenic acidity. *Science of the Total Environment.* 408: 3040-3050.
21. **Greig, H. S**. and S. A. Wissinger. 2010. Reinforcing biotic and abiotic time constraints facilitate the broad distribution of a generalist with fixed traits. *Ecology*. 91: 836-846. *Best Student Publication, New Zealand Freshwater Sciences Society, 2010.*
22. Wissinger, S. A., **H. Greig**, and A. McIntosh. 2009. Absence of species replacements between permanent and temporary lentic habitats in New Zealand. *Journal of the North American Benthological Society.* 28: 12-23.
23. **Greig, H. S**., and A. R. McIntosh. 2008. Density reductions by predatory trout increase adult size and fecundity of surviving caddisfly larvae in a detritus-based stream food web. *Freshwater Biology* 53: 1579-1591. *Featured on journal cover.*

24. Wissinger, S. A., A. R. McIntosh, and **H. S. Greig**. 2006. Impacts of introduced brown and rainbow trout on benthic invertebrate communities in shallow New Zealand lakes. *Freshwater Biology* 51:2009-2028.
25. **Greig, H. S**., and A. R. McIntosh. 2006. Indirect effects of predatory trout on organic matter processing in detritus-based stream food webs. *Oikos* 112:31-40. *Honourable mention, Best Publication by a New Researcher, New Zealand Ecological Society, 2008*.
26. Wardhaugh, C. W., T. J. Blakely[†], **H. Greig**, P. D. Morris[†], A. Barnden[†], S. Rickard[†], B. Atkinson[†], L. L. Fagan, R. M. Ewers, and R. K. Didham. 2006. Vertical stratification in the spatial distribution of the beech scale insect (*Ultracoelostoma assimile*) in *Nothofagus* tree canopies in New Zealand. *Ecological Entomology 31:185-195.*
27. McIntosh, A. R., **H. S. Greig**, S. A. McMurtrie, P. Nystrom, and M. J. Winterbourn. 2005. Top-down and bottom-up influences on populations of a stream detritivore. *Freshwater Biology* 50:1206-1218.

BOOKS

28. Harding, J. S., J. F. Clapcott, J. M. Quinn, J. W. Hayes, M. K. Joy, R. G. Storey, **H. S. Greig**, T. James, M. Beech, R. Ozane, J. Hay, A. Meredith, and I. K. G. Boothroyd. 2009. Stream habitat assessment protocols for wadeable rivers and streams of New Zealand. University of Canterbury Press. 978-0-473-15151-5.

TECHNICAL REPORTS

29. **Greig H. S.** 2010. Understanding the effects of climate change on freshwater ecosystems. Branchlines publication of the Faculty of Forestry, University of British Columbia.
30. Cavanagh, J. A., J. Pope, J. S. Harding, D. Trumm, J. Craw, R. Rait, **H. S. Greig**, D. Niyogi, R. Buxton, O. Champeau, and A. Clemens. 2010. A framework for predicting and managing water quality impacts of mining on streams: a user's guide. Landcare Research New Zealand Ltd. 138p.
31. **Greig, H. S.**, J. S Harding and D. Gray. 2009. Benthic invertebrate and fish communities in streams associated with the proposed Bishops Block coal mine. Report to Solid Energy New Zealand Limited. 15p.
32. Harding, J. S., J. Cavanagh, O. Champeau, **H. S. Greig**. 2009. Using stream insects to predict the health of rivers with coal mine inputs. Fact Sheet 3. Framework for predicting and managing the environmental impacts of mining on streams.

MANUSCRIPTS IN PREPARATION (COMPLETE DRAFTS):

1. Warburton H. J.[†], McHugh, P. A., **Greig, H. S**. and A. R. McIntosh. Body mass-abundance relationships are responsive to environmentally induced community change.
2. Haghkerdar, JM[†], McLachlan, J.R. [†], Toth, E.* and **Greig, H.S.** The effect of successional state, mobility and trophic level on community vulnerability to disturbance in pond mesocosms.
3. **Greig, H. S**., S. A. Wissinger, and A. R. McIntosh. Unpredictable disturbances in freshwater habitats drive nested patterns of community assembly.

INVITED PRESENTATIONS († Graduate student co-author; *Undergraduate student co-author)

1. **Greig, H.S.,** Shepard, I†., Taylor, B, DelVeccia, A., Washko, S†. Balik, J†. Klemmer, A.J. & S.A Wissinger. Community and ecosystem consequences of species range shifts. 2018. Utah State University, Logan, UT, *Invited seminar speaker.*
2. Greig, H. S., Haghkerdar, J†., McHugh, P. A., and McIntosh, A. R. 2017. Do environmental stresses alter the resilience of freshwater invertebrate communities to climate change? Invited presentation at the 41st annual meeting of the Maine Chapter of The Wildlife Society.
3. Greig, H. S. 2017. Integrating food-web processes into salmon restoration: Examples from the top and the bottom of freshwater food webs. Annual meeting of the Atlantic Salmon Recovery Framework's Downeast SHRU, Machias, Maine.
4. Greig, H. S. 2016. Maine's streams and rivers: the interplay between water, rocks and biology. Keynote address. Kennebec Land Trust Annual Lyceum.
5. Greig H.S. 2015. Experimental evidence that hemlock decline changes the role of detrital subsidies in freshwater food webs. *Invited talk* for the special session "Effects of disturbance on consumer mediated habitat linkages". 100th Annual Meeting of the Ecological Society of America, Baltimore, MD.
6. Greig, H. S. 2015. Unravelling the multiple impacts of climate change on forested freshwater ecosystems. *Invited* talk for the special session" The science and management of cumulative effects of multiple stressors on forested landscapes". Northeastern Ecosystems Research Co-operative biennial meeting, Saratoga Springs, NY.
7. Greig, H. S. 2014. Trophic interactions in a changing climate: Linking mechanisms with outcomes in freshwaters. *Invited seminar*. Environmental Science Evening Lecture Series. Colby College
8. Greig, H. S. 2014. Trophic interactions in a changing climate: Linking mechanisms with outcomes in freshwaters. *Invited seminar*. Environmental Sciences Seminar Series, University of New Hampshire.
9. Greig, H. S. 2014. Trophic interactions in a changing climate: Linking mechanisms with outcomes in freshwaters. *Invited seminar*. Freshwater Science Consortium Seminar Series. University of Maine.
10. Greig, H. S. 2014. Trophic interactions in a changing climate: Linking mechanisms with outcomes in freshwaters. *Organismic and Evolutionary Biology Program Seminar Series*, University of Massachusetts Amherst.
11. Greig H. S. 2014. Understanding the contingencies: how environmental context alters the effects of warming on freshwater food webs. *Invited seminar* for the special session "Effects of climate change on species interactions in aquatic ecosystems". 2014 Joint Aquatic Sciences Meeting, Portland, OR.
12. Greig H. S. 2011. Species interactions in a changing climate: lessons from experiments with pond food webs. *Plenary Talk*, Joint Australian Society for Limnology and New Zealand Freshwater Sciences Society Annual Meeting, Brisbane.
13. Greig H. S. 2011. Interactive effects of global change on freshwater ecosystems: an experimental approach. 2011. *Invited seminar*. Ecology Department, Lincoln University.
14. Greig, H. S., Kratina, P., Thompson, P., Shurin, J. B., and Richardson, J. S. 2010. Cross-ecosystem effects of global change. *Invited seminar* for the organised session "Across Systems and Biomes: Ecology and Evolution of Insects in Aquatic Habitats". Entomological Society of America Annual Meeting, San Diego.

RECENT CONTRIBUTED PRESENTATIONS* (PAST 5-YEARS)

1. Wissinger, S.A., Balik, J[†]. Taylor, B., **Greig, H.S.,** DelVeccia, A., Klemmer, A.J. & I. Shepard[†]. 2017. Elevational Range Shifts in Alpine Aquatic Insects and Consequences for Ecosystem Function. Annual Meeting of the Entomological Society of America, Denver CO.
2. Wissinger, S.A., Balik, J[†]. Taylor, B., **Greig, H.S**., DelVeccia, A., Klemmer, A.J., Shepard, I., Washko, S[†], Lund, J. and M Vlah. 2017. Washko, S Caddisflies & Climate-Change: Range shifts along Elevational and Permanence Gradients in High Elevation Ponds. University of Arkansas, AR.
3. McLachlan, J. R. [†], B. Adams*, E. Nolan*, J. M. Haghkerdar[†] and **H. S. Greig.** 2017. Spatial turnover of benthic communities is greater across a freshwater tidal height gradient than between temporary and permanent ponds. Society of Freshwater Science Annual Meeting. Raleigh, NC. 6 June 2017
4. Ramberg-Pihl, N. [†], **Greig, H.,** Coghlan, S., Zydlewski, J. The Impacts of Competition on Juvenile Atlantic Salmon Recovery (*Salmo salar*) in a Rapidly Changing Climate. Borns Symposium. April 2017. University of Maine (Orono, ME). Approx. 50 in attendance (also streamed live online, amount of viewers unknown).
5. Ramberg-Pihl, N.[†], **Greig, H.,** Coghlan, S. The Impacts of Competition on Juvenile Atlantic Salmon Recovery (*Salmo salar*) in a Rapidly Changing Climate. Annual Fall IGERT Retreat. 15 September 2017. Wooley Conference Room, University of Maine (Orono, ME). Approx. 15 in attendance.
6. Nelson, S., Willacker, J., Eagles-Smith, C., Krabbenhoft, D., Flanagan Pritz, C., Klemmer, A., **Greig, H.S.**, Chen, C. and Haro, R. 2017. The Dragonfly Mercury Project: a national scale evaluation of variation in biosentinel mercury concentrations and landscape drivers across US national parks. The International Conference on Mercury as a Global Pollutant. Providence, RI.
7. Warburton, H. [†], P. A. McHugh, P. G. Jellyman, **H. S. Greig** and A. R McIntosh. 2016 Consequences of changes in community structure across environmental gradients revealed using body mass-abundance relationships. Society of Freshwater Science Annual Meeting. Sacramento, CA. May 2016.
8. **Greig, H. S.,** K. Capps, J. Gill, A. Klemmer, R. M. Northington, and T. Parr. 2016. Experimental evidence that hemlock decline changes the role of detrital subsidies in freshwater food webs. Society of Freshwater Science Annual Meeting. Sacramento, CA. May 2016.
9. McLachlan, J. R. [†], B. Adams*, E. Nolan* and **H. S. Greig.** 2016 Draining the tank twice a day: what tidal freshwaters can tell us about the role of hydrology in benthic community structure. Society of Freshwater Science Annual Meeting. Sacramento, CA. May 2016
10. Haghkerdar, J.M. [†], J. R. McLachlan[†], E. Toth*, A. Ireland*, and **H. S. Greig.** 2016. The influence of successional state on community responses to disturbance in pond mesocosms. Society of Freshwater Science Annual Meeting. Sacramento, CA. May 2016
11. Wissinger, S. A., S. Washko*, J. Balik*, B. Taylor, **H. S. Greig**. 2016. Predicting how shifts in caddisfly distributions along hydroperiod and elevational gradients affect ecosystem processes in shallow high-elevation ponds. Society of Freshwater Science Annual Meeting. Sacramento, CA. May 2016.
12. **Greig, H. S.** 2016. Maine's rivers in a changing climate. Invited talk. Climate change impacts on Wabanaki tribal planning symposium. Presque Isle, ME. June 2016
13. Haghkerdar, J.M. [†], McLachlan, J.R. [†], Toth, E.S*, Ireland, A***, Greig, H.S.** 2016. The influence of successional state on community responses to disturbance in pond mesocosms. UMaine Graduate Research Symposium, Bangor, ME, USA. Oral presentation.

14. Greig, H. S. 2016. Improving assessment of critical habitat for Atlantic salmon in a rapidly-changing climate. Maine Sea Grant Research Symposium. University of Maine.
15. Ramberg-Pihl, N. †, Greig, H., Coghlan S., Zydlewski J. 2016. Unraveling the impacts of temperature, flow, prey availability, and competition on juvenile Atlantic salmon (*Salmo salar*) performance in a rapidly changing climate. Poster Presentation. Climate Change Institute Born's Symposium. 14 April 2016. University of Maine (Orono, ME). Approx. 100 people in attendance.
16. Nelson, S., C. Eagles-Smith, J. Willacker, D.P. Krabbenhoft, C. Pritz, **H. Greig**, C. Chen, and R. Haro. 2016. *The Dragonfly Mercury Project: linking surface water chemistry and landscape characteristics to biotic sentinels at a national scale*. 40th Annual New England Association of Environmental Biologists Meeting, ME.
17. Nelson, S., C. Eagles-Smith, J. Willacker, D.P. Krabbenhoft, C. Pritz, **H. Greig**, C. Chen, and R. Haro. 2016. *The Dragonfly Mercury Project: linking surface water chemistry and landscape characteristics to biotic sentinels at a national scale*. 9th International Conference on Acid Deposition, NY.
18. Wissinger, S. A., Balik, J. †, **Greig, H. S**. and B. Taylor. Predicting the effects of range shifts in high-elevation pond caddisflies on ecosystem processes. 100th Annual Meeting of the Ecological Society of America, Baltimore, MD.
19. Veitch E*. and **Greig, H. S.** April 2015.Food resource quality influences individual and community characteristics of detritus-feeding aquatic insects. Center for Undergraduate Research Showcase.
20. McLachlan, J.R. † and **Greig, H. S**. March 2015. Integrating tidal freshwaters into conceptual models of how hydrology structures wetland benthic communities. Maine Assoc. Wetland Scientists Winter Conference, Bowdoin College, ME.
21. Haghkerdar, J.M. †, and **Greig, H. S**. January 2015. Benthic community responses to disturbance in artificial stream channels. 1st Annual UMaine Freshwater Science Symposium. Orono, ME.
22. McLachlan, J.R. † and **Greig, H. S.** The forgotten cousin in lentic community ecology: freshwater tidal wetlands. January 2015. 1st Annual UMaine Freshwater Science Symposium, Orono, ME.
23. Veitch E* and **Greig, H. S**. January 2015. Shifts from coniferous to deciduous litter increases aquatic insect growth. 1st Annual UMaine Freshwater Science Symposium. Orono, ME.
24. Jackson, R.*, N. Tomczyk*, L. Podzikowski†, **H. S. Greig**, K. Capps 2014. Patterns in macro-invertebrate community composition in vernal pools in the northeastern United States. Joint Aquatic Sciences Meeting, Portland, OR. Abstract ID: 13122.
25. Wissinger, S.A., A.J. Klemmer, E. J. Thornton†, M. Perchik, R. J. Burns, **H. S. Greig**, and C. Eddy. Density-dependent nutrient cross-links between detritus processing and benthic algae in shallow ponds and wetlands. 2014 Joint Aquatic Sciences Meeting, Portland, OR. Abstract ID: 14028.
26. McIntosh, A. R., S. E. Graham†, J. M. O'Brien, C. M. Febria, P. A. McHugh, **H. S. Greig** and J. S.; Harding. 2014. Using food-web theory to enhance the effectiveness of aquatic restoration. Joint Aquatic Sciences Meeting, Portland, OR. Abstract ID: 14171
27. Weil, K. †, C. S. Cronan, R. J. Lilieholm, C. S. Loftin, **H. S. Greig**, M. Johnson and S. R. Meyer. 2014. A spatial analysis of biophysical watershed characteristics affecting stream response to land-use changes in Maine, U.S.A. Ecological Society of America Annual Meeting, Sacramento, CA.
28. Vasseur D. A., Gilbert B., O'Connor M. I., Kratina P., **Greig H. S**., Tunney T. D., Barton B. T., Kharouba H. M., McCann K. S., Harley C. D., Winder M. 2013. Predicting responses to temperature variation: Ecology and Evolution in trophic systems. Ecological Society of America Annual Meeting, Minneapolis, MN.

29. Warburton, H. †, **Greig, H. S.** and A. R McIntosh. Predicting consumption rates in food webs using predator body size and prey abundance. 2013 Ecological Society of America Annual Meeting, Minneapolis, MN.
30. M. I. O'Connor, P. Kratina**, H. S. Greig**, D. A. Vasseur, T. D. Tunney†, B. T. Barton, H. M. Kharouba†, K. S. McCann, C.D.G. Harley, M. Winder, V. M. Savage, B. Gilbert, J. Shurin and J . P. DeLong. 2013 Linking theory and experiments: A meta-analysis of multi-trophic warming experiments. Ecological Society of America Annual Meeting, Minneapolis, MN.

* plus lead-authored presentations at meetings of the Ecological Society of America (4), North American Benthological Society (3), New Zealand Ecological Society (1), and New Zealand Freshwater Sciences Society (6), and seminars at the Rocky Mountain Biological Laboratory (2), University of British Columbia (3) and University of Canterbury (2).

COLLABORATIVE NETWORKS AND WORKING GROUPS

2018 - Winter Ecology Working Group, Schoodic Institute, Schoodic, Maine. 15 – 16 February 2018. 25 attendees spanning institutions including UMaine Orono, U Southern Maine, UMaine Farmington, Acadia National Park, MDIFW, USGS, NOAA, Old Town High School, Maine Natural Areas Program, Manomet, Schoodic Institute. This workshop was part of an effort by an interdisciplinary, multi-institutional team to build a collaborative network around winter ecology research in Maine.

2017- Emerging collaboration with Professor David Patterson and Dr Andrew Blight of the Sediment Ecology Research Group at the University of St Andrews, Scotland on biogeographic variation in the ecology of tidal freshwater marshes.

2016- NSF-funded collaborative research with Professor Scott Wissinger (Allegheny College, Meadville, PA) and Assistant Professor Brad Taylor (NC State University, Durham. NC) on the ecosystem consequences of climate-induced species range shifts. Research is based at the Rocky Mountain Biological Laboratory, Gothic, CO, and also includes a collaborative undergraduate research experience (CURE) at each of our three institutions.

2015 - Collaborating with Dr. Sarah Nelson (School of Forest Resources), USGS scientists and interpretive staff from the National Park Service, and citizen scientists from > 50 National Parks on a project that is using dragonfly larvae as sentinels of mercury pollution in lakes and other freshwaters.

2014 Non-attending contributor. International workshop "*Surrogates and indicators in resource management and conservation*". Fenner School of Environment and Society, The Australian National University, Canberra, Australia.

2014- Ongoing collaborations with scientists from the University of Canterbury, New Zealand, The University of Canberra, Australia, Utah State University, and Vermont Fish and Wildlife on research investigating the influence of ecosystem size on food webs.

2014 Participant. Stream Sensitivity Focus Group run by MS student Kristen Weil. This group brought together state and local stream ecologists and water managers to develop a Bayesian Belief Network based on expert opinion to determine which streams in Maine are most susceptible to degradation.

2013 Co-organiser and chair. Invited Symposium "*Warming consumers and their prey: general principles and applications for how temperature affects trophic interactions*" at the 98th Annual Meeting of the Ecological Society of America. August 2013

2012-2013 Co-organizer. National Centre for Ecological Analysis and Synthesis working group. *Synthesizing theory and databases to advance a general framework for how warming affects trophic interactions*.

2011-2012 Co-organizer. Canadian Institute of Ecology and Evolution (CIEE) working group. *Integrating body size and thermal scaling to understand the effects of temperature on food webs.*

TEACHING AND STUDENT MENTORING

Semester	Course	Course Name	Cr.	% Resp	Students	Work Load
Fall 2018	EES 598-0001*	Special Seminar in Ecology and Environmental Science: Ecology and Evolution of Everything	1	20	7	Unpaid Overload
Fall 2018	BIO-463-0001	River Ecology	4	100	22	Assigned
Spring 2018	BIO 222-0001*	Biology: The Living Science	3	50	117	Assigned
Spring 2018	BIO 388-0009	Independent Study Capstone in Biology. Forest-Freshwater Linkages	2	100	2	Assigned
Spring 2018	BIO 392-0002†	Independent Study Capstone in Biology. Evolutionary Ecology of Aquatic Insects	1	100	1	Unpaid Overload
Spring 2018	EES 598-0001*	Special Seminar in Ecology and Environmental Science: Ecology and Evolution of Everything	1	20	4	Unpaid Overload
Fall 2017	BIO 388-0014†	Independent Study Capstone in Biology. Forest-Freshwater Linkages	1	100*	1	Unpaid Overload
Fall 2017	BIO 392-0003†	Independent Study Capstone in Biology. Evolutionary Ecology of Aquatic Insects	3	100*	1	Unpaid Overload
Fall 2017	EES 598	Special Seminar in Ecology and Environmental Science: Ecology and Evolution of Everything	1	20	4	Unpaid Overload
Fall 2017	BIO 597-0010†	Advanced Ecology and Systematics of Aquatic Insects	4	100*	2	Assigned
Fall 2017	BIO 430/BIO 388-0002†	Ecology and Systematics of Aquatic Insects. Lecture and lab.	4	100*	15	Assigned
Spring 2017	BIO 387-0006†	Undergraduate Research in Biology: Experiments in Freshwater Ecology.	1	100*	1	Unpaid Overload
Spring 2017	EES 590	Special Topics in Ecology and Environmental Science: Ecology and Evolution of Everything	1	20	5	Unpaid Overload
Spring 2017	BIO 222‡	Biology: The Living Science	3	50*	101	Assigned
Spring 2017	HON 499	Honors Thesis	3	100	1	Unpaid Overload

Fall 2016	EES 590	Special Topics in Ecology and Environmental Science: Ecology and Evolution of Everything	1	20		Unpaid Overload
Fall 2016	BIO 463‡	River Ecology	4	100*	21	Assigned
Fall 2016	Hon 498	Honors Directed Study	3	100	1	Unpaid Overload
Spring 2016	BIO 222‡	Biology: The Living Science	3	50*	155	Assigned
Spring 2016	EES 590	Special Topics in Ecology and Environmental Science: Ecology and Evolution of Everything	1	20	5	Unpaid Overload
Fall 2015	BIO 430‡	Ecology and Systematics of Aquatic Insects. Lecture and lab.	4	100*	5	Assigned
Fall 2015	BIO 597‡	Special Topics in Biology: Ecology and Systematics of Aquatic Insects	3	100*	1	Assigned
Fall 2015	EES 590	Special Topics in Ecology and Environmental Science: Ecology and Evolution of Everything	1	20*		Unpaid Overload
Spring 2015	HON 499	Honors Thesis	3	100	1	Unpaid Overload
Spring 2015	EES 590	Special Topics in Ecology and Environmental Science: Ecology and Evolution of Everything	1	20	5	Unpaid Overload
Fall 2014	BIO 463‡	River Ecology	4	100*	14	Assigned
Fall 2014	BIO 597-0003‡	Special Topics in Biology - River Ecology. Lecture and lab.	4	100*	5	Assigned
Fall 2014	BIO 687 - 0002†	Special Problems in Biology: Adv Taxonomy of Aquatic Insects	3	100*	1	Unpaid Overload
Fall 2014	HON 498	Honors Directed Study	3	100	1	Unpaid Overload
Fall 2014	NFA 117 - 0009	Issues and Opportunities	1	100*	22	Assigned
Summer 2014	EES 590 - 0002†	Special Topics in Ecology and Environmental Science: Ecology and taxonomy of aquatic insects	1	100*	1	Unpaid Overload
Fall 2013	BIO 430‡	Ecology and Systematics of Aquatic Insects. Lecture and lab.	4	100*	10	Assigned
Fall 2013	BIO 391†	Undergrad Independent Study in Biology	1	100*	2	Unpaid Overload

* Role as course coordinator; † Courses that I developed; ‡ Courses that I substantially restructured

STUDENT EVALUATIONS: UNIVERSITY OF MAINE

Term & year	Course		Enrollment	Mean Evaluation Rating*						*N*
	Number	Credits		Q13	Q22	Q4	Q5	Q9	Q33	
Fall 2013	BIO 430	4	10	5.00	5.00	4.90	4.90	5.00	4.89	10
NSFA College averages; upper-division courses.				4.40	4.11	4.29	4.36	4.64	4.28	
Fall 2014	BIO 463	4	19	4.87	4.47	4.79	4.73	4.93	4.75	15
NSFA College averages; upper- division courses.				4.43	4.15	4.29	4.43	4.65	4.22	
Fall 2015	BIO 430	4	7	5.00	5.00	5.00	4.83	5.00	5.00	6
NSFA College averages; upper- division courses.				4.43	4.15	4.32	4.42	4.69	4.28	
Spring 2016	BIO 222	3	155	4.49	3.97	4.26	4.39	4.79	NA	91
NSFA College averages; lower- division courses.				4.32	3.85	4.13	4.26	4.62		
Fall 2016	BIO 463	4	21	4.88	4.65	4.71	4.82	5.00	4.79	19
NSFA College averages; upper- division courses.				4.45	4.15	4.34	4.45	4.72	4.25	
Spring 2017	BIO 222	4	98	4.49	4.05	4.37	4.18	4.65	NA	63
NSFA College averages; lower- division courses				4.43	3.85	4.16	4.28	4.59		
Spring 2017	BIO 222	4	98	4.49	4.05	4.37	4.18	4.65	NA	63
NSFA College averages; lower- division courses				4.32	3.85	4.13	4.26	4.62		
Fall 2017	BIO 430	4	17	5.00	4.93	4.93	4.93	5.00	4.75	15
NSFA College averages; upper- division courses.				4.43	4.15	4.32	4.42	4.69	4.28	

***Q13:** Overall, how would you rate this instructor; **Q22:** What is your overall rating of this course; **Q4:** How clearly did the instructor present ideas; **Q5:** How much were students encouraged to think for themselves; **Q9:** Did the instructor show respect for questions and opinions of students; **Q33:** What is your overall rating of the lab course.

Sample of student comments

BIO 430: Ecology and Systematics of Aquatic Insects

"Hamish is easily the best and most enthusiastic prof I have had in the 8 years of higher ed. I've taken."

"This was an excellent course. Hamish is very enthusiastic about Aquatic Ent and I think that helped us to be too…. I really liked reading and discussing scientific articles."

"The instructor made class fun and interesting. His use of real case studies really helped solidify key concepts. Class was always worth attending, enjoyable, and a great learning environment."

"Excellent class, assignments were all valuable and relatable to real work that was done. I learned many valuable career skills."

"Dr. Greig is an excellent instructor. Throughout the course, he presented the material with thoroughness and enthusiasm, encouraged discussion and questions challenged us to think and apply our knowledge, and provided plenty of opportunities to develop new skills."

"Hamish has been one of the most beneficial instructors of my undergrad career. He cares about student success and teaching them actual application/skills. Loved the course and it will help me very much in grad school"

BIO 463: River Ecology

"Amazing course, amazing instructor, one of the most interesting and engaging courses I have taken."

"Truly one of the best classes and professors on campus. I felt like I learned some applicable skills for working in the science/ecology fields."

"Hamish is one of the most caring, enthusiastic and well-rounded professors I have ever met. He is patient with students, and integrates his own life experiences and several research papers into every lecture."

"Research projects were a great way to make the course more interactive and further develop skills. Hamish was always very helpful and clearly passionate about rivers!"

"I enjoyed this class a lot. There was a good balance between lecture, case studies, lab and discussion. The chance to complete an independent research project from start to finish game me a new set of skills and appreciation for the scientific process. "

BIO 222: Biology: The Living Science

"Very good class. I appreciated the discussions as a class."

"Professor Greig is a true teacher. His passion for his work shines through the enthusiasm of his words. Great Professor!"

"Very enthusiastic. Very knowledgeable of his topic."

"Professor Greig always presented enthusiastically and he took questions respectfully. He made the course very enjoyable".

"Excellent text book. Having most of the chapters be a story with key terms embedded throughout really helped me learn faster and easier. Excellent instructor(s)."

GRADUATE STUDENTS SUPERVISED (CHAIR OR CO-CHAIR)

2017-	Megan Hess	M.S.	UMaine	Dragonflies as bioindicators of mercury pollution
2017-	Chase Gagne	M.S.	UMaine	Aquatic insect communities of riverine rock pools
2017-	Mitchell Paisker	M.S.	UMaine	Effects of alternative silviculture practices on forest-freshwater linkages
2017-	Jack McLachlan	Ph.D	UMaine	Mechanisms driving community organization across ecotones.
2016-	Isaac Shepard	Ph. D.	UMaine	Causes and consequences of species range shifts
2015-	Nicole Ramberg-Pihl	Ph. D.	UMaine	Climate-mediated impacts of invasive fish on Atlantic salmon.
2014-16	Jessica Haghkerdar	M.S.	UMaine	Interactive effects of disturbances on stream food webs
2014-16	Jack McLachlan	M.S.	UMaine	Community structure of ephemeral wetlands across environmental gradients
2011-15	Helen Warburton	Ph.D.	UCanterbury	The stability of size-structured stream food

				webs.
2012-14	Emma Porter	M. Sc.	UCanterbury	Effects of riparian buffers on stream sedimentation
2009-10	Troy Watson	M.Sc.	UCanterbury	Stream invertebrate communities in caves.
2009-10	Justin Kitto	M.Sc.	UCanterbury	Mining impacts on stream invertebrates.

GRADUATE STUDENTS AWARDS

Jack McLachlan (PhD) Janet Waldron Doctoral Research Fellowship.
Jack McLachlan (MS): NSFA Fred Griffee Award for Outstanding Graduate Research; SBE Outstanding Graduate Student in Entomology Award; UMaine EES Summer Graduate Fellowship $6719; UMaine EES Undergraduate Student Research Assistant Funding $3000; UMaine Graduate Student Government Degree-related Grant , $850; Society of Wetland Scientists Student Research Grant, $1000; Enhancing Undergraduate Experience Award (UMaine), $250; Elected Member of Golden Key International Honours Society.
Jessica Haghkerdar (MS): Maine Graduate Student Government Travel to Present Grant, $500.
Nicole Ramberg-Pihl (PhD): Atlantic Salmon Federation Olin Award, $1500; NSF IGERT Graduate Fellowship in the Adaptation to Abrupt Climate Change program.
Isaac Shepard (PhD): UMaine Graduate Student Government Grant. $630.
Chase Gagne: UMaine Graduate Student Government Grant. $480

UNDERGRADUATE HONORS AND CAPSTONE STUDENTS SUPERVISED (CHAIR)

2018	Kathleen Brown	Capstone	UMaine	Connections between detritus, detritivores and stream nutrients across a gradient of riparian management.
2018	Ethan Cantin	Capstone	UMaine	The response of stream macroinvertebrate communities to alternative riparian management prescriptions
2018	Mykayla Hagaman	BS Hons	UMaine	Effects of climate-induced range shifts on caddisfly population dynamics
2018	James Leake	Capstone	UMaine	Ecology and evolution of the griffonflies
2018	Tyler Everett	Capstone		Effects of alternative silviculture practices on forest-freshwater linkages
2016	Chase Gagne	BS Hons.	UMaine	Ecology of riparian rock pools in the Penobscot River corridor. *Awarded Highest Honors*.
2015	Eric Veitch	BS Hons.	UMaine	Impacts of spruce budworm outbreaks on stream communities. *Awarded Highest Honors*
2014	Cara Rudnicki	BS Hons.	UVermont	Effects of road salt on stream food-web interactions *Awarded Highest Honors*
2014	Wayne Heideman	Capstone	UMaine	The impacts of recreation on freshwater insects
2014	Tim Armistead	Capstone	UMaine	A review of wetland conservation in Maine

GRADUATE AND UNDERGRADUATE STUDENT COMMITTEES

2017-18	Nicholas Kovalik	BS Hons	UMaine	Legacy effects of clear-cuts on forested freshwaters
2017-18	Jackson Foley	BS Hons	UMaine	Characterizing lysogeny in cluster E mycobacteriophage Ukulele
2017-18	Spencer DeBrock	BS Hons		Effects of landscape variables on tick distribution
2017-	Joe Mohan	Ph. D.	UMaine	Diatom paleo-reconstruction

2017-	Edna Pedraza Garzon	Ph. D.	UMaine	Responses of diatom communities to environmental change
2017-	Nicholas Kovalik	BS Hons	UMaine	Legacy effects of clear-felling on forest-freshwater linkages.
2016-	Zachary Wood	Ph. D	UMaine	Contribution of rapid anti-predator evolution in fish to trophic cascades in ponds
2015-	Rachel Fowler	Ph.D.	UMaine	Dust and DOC dynamics in arctic lakes
2015-17	Carl Tugend	M.S.	UMaine	Contribution of geese to arctic lake ecosystems
2014-17	Laura Garey	M.S.	UMaine	Food-Web Dynamics and Community Structure in Northeastern Tidal Marshes
2014-18	Betsy Irish	Ph. D.	UMaine	Marine-derived nutrient cycling in the St. Croix River, Maine.
2014-15	Laurel Sacco	BS Hons	UMaine	The influence of interspecific interactions of predators and prey on energetic costs associated with prey foraging behavior
2014-17	Daniel Weaver	Ph. D.	UMaine	Ecological importance of anadromous sea lamprey as vectors of marine-derived nutrients in freshwater systems and the distribution of juveniles in the Penobscot watershed
2014-	Brett Gerrard	Ph. D	UMaine	Stream Dynamics in a Coupled Human-Climate-Postglacial System
2013-	Carly Eakin	Ph. D.	UMaine	Population persistence of pool breeding amphibians in urban systems: Movement and survival of wood frog and spotted salamander urban systems
2013-15	Benjamin Burpee	M. S.	UMaine	Heterotrophic bacterial activity across lakes of Southwest Greenland
2013-17	Heera Malik	Ph. D.	UMaine	Deciphering the mechanisms behind climate-driven change in the relative abundances of the diatom *Cyclotella*.
2013	Kristen Weil	M.S.	UMaine	Assessing stream susceptibility to land-use change.

Undergraduate Research Associates ([†]Co-advised; UMaine only)

2018	Keegan Feero	EES	Influence of Atlantic salmon and crayfish on detritivores and detritus breakdown in headwater streams
2017-18	Lindsey Ridlon	EES	Community and ecosystem consequences of climate-induced species range shifts
2017	Spencer Kelley	WLE	Climate-mediated impacts of bass on Atlantic salmon
2017	Tyson Porter	WLE	Climate-mediated impacts of bass on Atlantic salmon
2017	Mitchell Paisker	EES	Climate-mediated impacts of bass on Atlantic salmon
2017	DeCorey Bolton	SBE	Atlantic salmon and brook trout husbandry
2017	Cassidy Bigos	SBE	Atlantic salmon diet analysis
2017	Lindsey Ridlon	EES	Community consequences of species range shifts
2016	Daniel Perry	EES	Climate-mediated impacts of bass on Atlantic salmon
2016	Mitchell Paisker	EES	Climate-mediated impacts of bass on Atlantic salmon
2016-	Val Watson	EES	Effects of hydroperiod and fish on invertebrate

			communities of Greenland ponds
2016	Nicole Keiffner	EES	NOAA Internship: Measuring the success of stream restoration on Atlantic salmon prey organisms
2015-16	Emma Toth	Bio/ Pre-med	Succession and disturbance in freshwater communities
2015-16	Erin Nolan	EES	Invertebrates of freshwater tidal marshes. EES Undergraduate Student Research Assistantship.
2015-16	Jackson Foley	Bio Hons	Effects of hemlock decline on pond food webs
2015-16	Amanda Fall	Marine Sci/ Fisheries	NOAA Internship: Measuring the success of stream restoration on Atlantic salmon prey organisms
2015	Braden Adams	EES	Invertebrates of freshwater tidal marshes. EES Undergraduate Student Research Assistantship
2015	Audrey Hoyle	Biochem.	Succession and disturbance in freshwater communities
2014	Adam Scheppard[†]	EES	Effects of hemlock decline on pond food webs
2014	Randi Jackson[†]	Wildlife Eco.	Invertebrate fauna of vernal pools

Graduate and undergraduate student theses and publications

1. McLachlan, J. R. *In press*. Dorothy J. Jackson FRES FLS, Scottish Entomologist: A Bibliography. Latissimus 42
2. McLachlan, J. R. 2018. High net loss of intertidal wetland coverage in a Maine estuary by year 2100. Maine Journal of Conservation and Sustainability 2
3. Gagne, C. 2017. Hydrology and aquatic invertebrate communities of riverine rock pools: effects of seasonality and the Penobscot River. B. S. Honors Thesis. *Chair and primary advisor*
4. Haghkerdar, J. S. 2016. Disturbance frequency and successional state alter community structure and vulnerability. M. S. Thesis. University of Maine. *Chair and primary advisor.*
5. McLachlan, J.R. 2016. The Forgotten Cousin in Freshwater Community Ecology: Tidal Freshwater Wetlands. M. S. Thesis. University of Maine. *Chair and primary advisor.*
6. Warburton H. J. 2016. The role of body size in predator-prey interactions and community structure. Ph.D. thesis. University of Canterbury. *Co-advisor.*
7. McLachlan, J.R. 2015. Integrating tidal freshwaters into conceptual frameworks for how hydrology structures benthic communities in wetlands. Wetland Science and Practice 34(4): 24.
8. Veitch, E. M. 2015. Evidence for aquatic ecosystem augmentation across a gradient of increasing terrestrial subsidy quality. B.Sc. Honors thesis. University of Maine. *Chair and primary advisor*
9. Rudnicki, C. 2015. Effects of road salt on the feeding rates of macroinvertebrates. B. Sc. Honors thesis. University of Vermont. *Chair and primary advisor*

MEDIA COVERAGE

09/15/2014	Fox 22/ABC 7 News Bangor/ The Republic/Sun Journal/SFGate, "U. Maine Studying Hemlock Die-off," Jaclyn Cangro
08/18/2014	UMaine News, "Past, present hemlock declines focus of UMaine research project"
04/15/2014	Fox 22 "Penobscot Fly Fishers introductory fly fishing day"

01/30/2014 YaleNews. "Temperature swings may be bigger threat to life than increased warmth."
02/24/2013 Vancouver Sun. "Predators in aquatic ecosystems are good for the earth's climate."
02/18/2013 ScienceNews/ScienceNews for Kids "Predators as climate helpers."
02/17/2013 New Scientist "Wiping out top predators messes up the climate."

PROFESSIONAL SERVICE

1. **Associate Editor:** Ecology and Evolution (open access). 2015 – Present. 15 manuscripts handled
2. **Associate Editor**: Freshwater Science. 2017 – Present. 3 manuscripts handled.
3. **Grant reviewer:** The National Science Foundation, Division of Environmental Biology Ecosystems panellist; Rocky Mountain Biological Laboratory Lee R. G. Snyder Memorial Fund.
4. **Manuscript referee:** Ecology Letters; Proceedings of the Royal Society B: Biological Sciences; Ecology; Ecological Applications; Biology Letters**,** Journal of Applied Ecology; Ecosphere; Oecologia; Biodiversity and Conservation; Landscape Ecology; Restoration Ecology; Ecological Research; Freshwater Biology; Freshwater Science; Journal of the North American Benthological Society; Antarctic and Alpine Research; Inland Waters; Journal of Experimental Marine Biology & Ecology; Ecological Entomology; Austral Ecology; Aquatic Sciences; New Zealand Journal of Ecology; Hydrobiologia; New Zealand Journal of Marine and Freshwater Research; Undergraduate Research in Biology; Ecology and Evolution (URBEE).
5. **Book reviewer:** Springer Publishing Company.
6. **Session chair:** 2013 Ecological Society of America Annual Meeting. Minneapolis, MN. USA
7. 2012 Society of Freshwater Science meeting. Providence, RI, USA.
8. **Judge:** Student presentation awards, 2012 Society of Freshwater Science meeting, Providence, RI, USA; 2011 New Zealand Freshwater Science Society meeting, Brisbane, Australia.
9. **Treasurer**: New Zealand Natural Sciences (a journal run by graduate students at the University of Canterbury). 2005-2007.

Professional Affiliations

Society of Freshwater Science (formerly North American Benthological Society), Entomological Society of America, Ecological Society of America, New Zealand Freshwater Sciences Society, New Zealand Ecological Society.

INSTITUTIONAL SERVICE

Service to the University of Maine.

1. University of Maine Faculty Fellows Program: 2015 - 2017
2. Co-PI with J. Saros and R. Northington on an undergraduate traineeship program to NSF IUSE Polar program entitled *"Fostering Interdisciplinarity through Theme-Based Encounters: The Arctic Coupled Systems (ArCS) Theme"*.
3. Co-PI with Zydlewski, G., Bell, K. and D. Brady on a $3-million multi-unit NSF graduate traineeship grant to develop an interdisciplinary training program for science at the intersection of food, energy and water. NSF-

NRT-INFEWS: *Integrating Renewable Energy, Fisheries, and Aquaculture: Advancing the Scientific Workforce to Sustain Coastal Systems.* We were not selected for funding and are reconsidering the scope of the program.

4. Co-PI with J. Saros and R. Northington on an undergraduate traineeship program to NSF IUSE Polar program entitled *"Fostering Interdisciplinarity through Theme-Based Encounters: The Arctic Coupled Systems (ArCS) Theme"*. We received positive feedback on our first submission and intend to resubmit in 2017.
5. I organized a booth at the Brewer Cabin Fever Reliever outdoor recreation and natural environment show (Brewer, Maine), 02/25/2017. Our table showcased freshwater and fisheries research at the University of Maine and graduate and undergraduate programs in SBE and EES. Our overall goal was to provide hands-on opportunities for the public to see how the research we do is relevant to their local habitats, wildlife and recreation opportunities. Over 1000 people attended the event over the weekend, many of whom stopped by our table to chat about our work and look at our displays of stream insects and research activities.
6. Arranged a listening session between the Downeast Salmon Federation and faculty members from UMaine and USM to discuss potential research collaborations and sharing data and infrastructure resources. The 12 participants included faculty and graduate students from UMaine's School of Biology and Ecology, Wildlife, Fisheries and Conservation Biology, School of Forest Sciences, and University of Southern Maine's Department of Environmental Science and Policy.
7. Center for Undergraduate Research Fellowship selection panel: 2016-2017
8. Adaptation to Abrupt Climate Change IGERT program Collaborative Immersion Project (CIP) proposal review committee.
9. Center for Undergraduate Research Faculty Fellow.
10. Judge at the Center for Undergraduate Research Academic Showcase. 2015, 2016.
11. Co-organizer and steering committee of the Freshwater Science Consortium at UMaine. This formalized interaction among 25 freshwater scientists on campus provides a collaborative environment in which to initiate and develop infrastructure, analytical capabilities, and areas of novel research. Our goal is to broaden the collaborative potential of freshwater scientists across disciplines and departments at UMaine, and in doing so, position UMaine as a national leader in freshwater science. 2015 – 2017
12. As a co-chair of the SBE Departmental Seminar Series Committee, I have fostered interaction among departments and schools across campus by (a) inviting speakers from related academic units, and (b) facilitating the co-sponsorship and co-hosting of speakers across units wherever possible.
13. Promoting interaction among academic units by serving on the committee of PhD students from units outside SBE. These include Earth and Climate Sciences, and Wildlife, Fisheries and Conservation Biology.
14. Facilitated academic visits from faculty and researchers from a wide range of national institutions. While these visits typically have been associated with seminar invitations, they also include collaborators on sabbatical. Academic visitors include. Professor Bobbi Peckarsky, U. Wisconsin Madison; Professor Scott Wissinger, Allegheny College, PA (sabbatical visitor); Professor Jonathan Shurin, UC San Diego; Professor Claudio Gratton, U. Wisconsin Madison; Assistant Professor Mark Galatowitsch, Center College, KY.

Service to the College of Natural Sciences, Forestry and Agriculture (NFSA)

1. Graduate Coordinator for the Ecology and Environmental Science Program
2. Presentations to EES first year students on the Ecosystem Ecology and Soil and Water Science concentrations. 2015, 2016, 2017

3. NSFA research presentation to State Senator and Margaret Chase Smith Distinguished Policy Fellow, Dawn Hill.
4. NSFA Graduate Research Awards Selection Committee: 2016, 2017
5. NSFA Outstanding Graduate Student Awards Committee: 2016, 2017
6. Ambassador for NSFA in the University Faculty Fellows Program.
7. Guest lectures for WLE 200 Wildlife Ecology and WLE 410 Wildlife Population Dynamics courses.

Service to the School of Biology and Ecology

1. Member of the Faculty Entomology Committee, participating in revision of Entomology MS program
2. Chair: SBE Outstanding Graduate Student in Entomology selection committee. 2016, 2017
3. Policy and Advisory Committee: 2016, 2017
4. Departmental Seminar Organizing Committee, 2014 - 2016
5. Graduate Committee: 2014, 2015, 2017
6. Instructor and co-organizer: Ecology and Evolution of Everything lunchtime discussion group
7. Faculty Search Committee Member: One Health Entomologist. 2015.
8. Faculty participant in the inaugural Sophomore Program Completion Workshop, March 2016
9. Faculty participant in the Schoodic Experience for incoming students. August 2014 & 2015.
10. I supervise and maintain the freshwater ecology research laboratory in Deering 213 and 217. The lab provides facilities for processing macroinvertebrate, water chemistry, sediment, and detritus samples, as well as equipment and support for spectrophotometric analysis of pigments. The lab is has supported postdocs and graduate students including: Isaac Shepard (SBE); Mitchell Paisker (EES, SBE); Chase Gagne (SBE, Entomology); Amy Baron (SBE, EES); Hannah Mittelstaedt (SBE, EES); Elliot Johnston (EES, SBE); Hannah Webber,(SBE, EES); Nicole Ramberg-Pihl (EES & SBE); Jack McLachlan (SBE & EES) Jessica Haghkerdar (SBE); Cara Rudnicki (U Vermont); Eric Veitch (SBE); Laura Garey (SBE); Amanda Klemmer (U Canterbury); Alex Bajcz (SBE); Regina Rancatti (SBE); Corianne Tatariw (SBE); Laura Podzikowski (WFCB); Betsy Irish (WFCB); Daniel Weaver (WFCB); Dr. Krista Capps (WFCB); Dr. Robert Northington (CCI).

COMMUNITY OUTREACH AND POLICY ENGAGEMENT

Stakeholder collaborative research and project meetings

1. Ongoing consultation with the Downeast Salmon Federation on restoration and research priorities for coastal Downeast rivers and their diadromous fisheries.
2. We have had three UMaine undergraduate students funded by a NOAA Fisheries internships (in collaboration with NOAA's John Kocik) to study the impacts of large wood restoration on invertebrates that support salmon in the Narraguagus River. Total value of the internships vary, but typically amount to 10 hours per week for the academic semester.
3. Consultation with Marine and Freshwater Scientists at Maine DEP on the use of macroinvertebrates to

monitor large wood restoration in mid-coast Maine rivers. 03/22/2017. We discussed sampling design sample processing and future collaborations that combine work in Midcoast Maine with Downeast Maine.

4. Participant and invited talk at the 2016 meeting of the Atlantic Salmon Recovery Framework's Downeast Region SHR, Machias, Maine. Meeting attended by >50 state, federal agency biologists, non-profit organizations and local high school students.
5. Participant in 2016 scoping workshop for understanding the effects of stream pH on Atlantic salmon performance, in collaboration with Mark Whiting (Maine DEP, emeritus), Russel Heath (Downeast Salmon Federation) and Jasmine Saros (Maine CCI).
6. Participant and invited talk at the 2016 meeting of the Atlantic Salmon Recovery Framework's Downeast Region SHR, Machias, Maine. Meeting attended by >50 state, federal agency biologists, non-profit organizations and local high school students.
7. Organized a listening session between the Downeast Salmon Federation and faculty members from UMaine and USM to discuss potential research collaborations and sharing data and infrastructure resources. The 12 participants included faculty and graduate students from UMaine's School of Biology and Ecology, Wildlife, Fisheries and Conservation Biology, School of Forest Sciences, and University of Southern Maine's Department of Environmental Science and Policy.
8. Participant in scoping workshop for understanding the effects of stream pH on Atlantic salmon performance, in collaboration with Mark Whiting (Maine DEP, emeritus), Russel Heath (Downeast Salmon Federation) and Jasmine Saros (Maine CCI).
9. Participant in the 2016 Collaborative Forestry Research Unit listening session with forestry companies, private landowners and forest managers to discuss research needs for forested ecosystems in Maine, and the interplay between forest economies and natural resource information.
10. Narraguagus River Focus Area Team meeting to discuss research priorities for the restoration of Atlantic salmon and their habitat in the Narraguagus River and other Downeast river catchments.
11. Project SHARE's stakeholder meeting. Project SHARE is a multiagency and stakeholder collaboration working to increase the connectivity of the Narraguagus River watershed to diadromous fishes such as Atlantic salmon, alewife and lamprey.
12. Member of the Stream Temperature Working Group, which is a collaboration of freshwater and fisheries scientists and resource managers from Maine DEP, Maine IFW, NOAA, USFWS, Penobscot Nation and the Atlantic Salmon Federation. We are developing a coordinated and consistent stream temperature monitoring network statewide, and building platforms for the wider dissemination of Maine stream temperature data. 2014-2016

Public talks, presentations and workshops.

1. Consulted for an upcoming book by Maine author Dale Wheaton, *Behind the Cast* which is a compendium of angling and guiding stories with a natural history and Atlantic salmon focus. I assisted with a chapter detailing the aquatic insect resources that support Maine's fisheries.
2. Presentation at the Rocky Mountain Biological Laboratory's outreach event "Research topics related to the Trout Fishery in Gunnison Valley". Title: *The bugs behind the flies: linking the natural history of aquatic insects to their imitations.*

3. Invited Speaker at the annual meeting of the Atlantic Salmon Recovery Framework's Downeast Region SHRU, Machias ME. 01/31/2017. *Integrating food-web processes into salmon restoration: Examples from the top and the bottom of freshwater food webs.* 50 attendees
4. Organized and attended a booth at the Brewer Cabin Fever Reliever outdoor recreation and natural environment show held at the Brewer Auditorium, (Brewer, Maine), 02/25/2017. Our table showcased freshwater and fisheries research at the University of Maine and graduate and undergraduate programs in SBE and EES.
5. Invited speaker at the Climate change impacts on Wabanaki tribal planning symposium. Presque Isle, ME. June 2016. I facilitated discussion on the future of Maine's rivers in a changing climate
6. Keynote speaker. Kennebec Land Trust Annual Lyceum 2016. 3/17/2016. *Maine's streams and rivers: the interplay between water, rocks, and biology.*
7. Guest Speaker, Brewer Cabin Fever Reliever event, 2/27/2016. The talk discussed introduced the common aquatic insects of Maine, their life cycles, and their importance to recreational fish diets.
8. Guest Speaker, Gorges River Trout Unlimited, 3/9/2015. The talk discussed introduced the common aquatic insects of Maine, how they are identified, and their importance to recreational fish diets.
9. Guest Speaker, Brewer Cabin Fever Reliever event, 2/28/2015. The talk discussed introduced the common aquatic insects of Maine, how they are identified, and their importance to recreational fish diets.
10. Guest Speaker, Maine Sportsman's Show, 2/21/2015. The talk discussed introduced the common aquatic insects of Maine, how they are identified, and their importance to recreational fish diets.
11. Developed and ran the session on "Bugs and Flies" for the Penobscot Fly Fishers introductory fly fishing course. April 2014, 2015, 2016. The interactive class featured live material demonstrations, preserved insects, and a presentation of photographs and videos.
12. Guest Speaker, MDI High School Adult Education fly fishing class. March 2014. I presented material introducing the common aquatic insects of Maine, how they are identified, and their importance to recreational fish diets.
13. Participated in discussion group with the Kezar Lake Watershed Association, Greater Lovell Land Trust, and FB Environmental to help develop a Climate Change Observatory in the western Maine -Kezar Lake Watershed in 2014, and build a long-term citizen-led climate-change program in Maine.
14. Guest Speaker, Penobscot Fly Fishers, May 2014. The talk discussed introduced the common aquatic insects of Maine, how they are identified, and their importance to recreational fish diets.
15. Guest Speaker, Penobscot Fly Fishers, November 2013. The talk discussed the links between freshwater science and fly fishing for New Zealand trout.

K-12 Education

1. Collaboration with the Gulf of Maine Research Institute's Vital Signs program to enhance inquiry based field learning for middle school science classes. I developed two Vital Signs missions focusing on the links between stream invertebrates and detritus breakdownhttp://vitalsignsme.org/mission-macroinvertebrate-function, and the influence of climate change on the distribution of freshwater species in Maine. http://vitalsignsme.org/mission-caddisfly-range. Although this project focusses on invertebrates, the rationale and context for communicating the broader importance of these processes lies in understanding the ecosystems that support wildlife, fisheries and water quality.

2. Contributing to the engagement of University of Maine with STEM education researchers across Maine (Gulf of Maine Research Institute, Vanderbilt University, Bowdoin College, and the Concord Consortium) in my position on the Science Advisory Board for a pending NSF grant "Developing a Modeling Orientation to Science: Teaching and Learning Variability and Change in Ecosystems".
3. Collaborative research with Dedham Middle School (7th grade) and Gulf of Maine Research Institute on a project using stream invertebrates to assess water quality of local streams and investigating the links between insect communities and leaf breakdown.
4. Working with a local (Brewer, ME) Cub Scout instructor to build units on stream health, restoration, and fisheries into their fall cub scouting activities.
5. We participated in a Dedham School, second grade class Atlantic salmon release at Leonard's Mill in Bradley, ME, 3 May 2016. The class (30 students, parents and teachers) released salmon into Blackman's Stream and we helped them catch and identify bugs with the children and parents, while also explaining their importance to the ecosystem (i.e. stream bugs are food for the salmon you just released).
6. I have mentored two Native American high school students during summer research internships as part of the Wabanaki Youth Science Program. One student has worked over 200 hours in the field and in the laboratory with my research group from 2014 - present, and is now leading laboratory projects and training undergraduate students in lab methods.
7. Developed and ran the entomology competition of the Maine section of the 2014 Science Olympiad. This was an inaugural year of the event at UMaine.
8. Many of the presentations and workshops I give at outdoor shows and recreational fishing clubs include a large number of K-12 students. I try where possible to include demonstrations of live insects to capture the attention of children and adults alike.
9. Freshwater science liaison for citizen scientist activities with the National Park Service sampling dragonflies as bio sentinels for mercury in Acadia National Park. My role included demonstrating freshwater invertebrate sampling techniques, to community and school groups, and educating participants on the tendency for toxins such as mercury to bioaccumulate in predatory animals.

Activities prior to UMaine

1. Elected Fish and Game Councillor, North Canterbury region, New Zealand. 2012 – 2013.
2. Community education lecturer for the University of Canterbury Biodiversity course.
3. Freshwater ecology representative for field trip of the Selwyn-Waihora Zone Committee of the Canterbury Water Management Strategy, Christchurch, New Zealand.
4. Led collaborative submissions by University of Canterbury freshwater ecologists on CERA Draft Recovery Strategy for Greater Christchurch, mining on conservation estate, and other proposed activities with environmental implications.
5. Knowledge transfer activities with the New Zealand Department of Conservation, Arawai Kākāriki Wetland Restoration Program, New Zealand Fish and Game, Forest and Bird Society, QEII National Trust, E. L Hellaby Indigenous Grasslands Research Trust.